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10/630,913	07/31/2003	Venugopal K. Srinivasamurthy	1509-437	7570
22879      7590      05/13/2008				
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INTELLECTUAL PROPERTY ADMINISTRATION				
FORT COLLINS, CO 80527-2400				
EXAMINER				
DAO, THUY CHAN				
ART UNIT		PAPER NUMBER		
2192				
NOTIFICATION DATE		DELIVERY MODE		
05/13/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/630,913

**Applicant(s)**

SRINIVASAMURTHY ET AL.

**Examiner**

Thuy Dao

**Art Unit**

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6, 8, 10-14 and 16 is/are pending in the application.
- 4a) Of the above claim(s) 17 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8, 10-14 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/31/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

#### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on February 14, 2008 has been entered.

2. Claims 1-4, 6, 8, 10-14, and 16 have been examined.

#### **Response to Amendments**

3. Per Applicants' request, claims 1, 8, 10-12, 14, and 16 have been amended.

#### **Response to Arguments**

4. Applicants' arguments have been fully considered. However, they are not persuasive.

a) Restriction Under 35 USC 121 (Remarks, page 5):

The Applicants recited MPEP section 803 in which it is stated that "if the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions" (Applicants' emphasis).

However, the Applicants have not submitted evidence or identified such evidence showing the newly added limitations (Amendments filed August 29, 2007) at least in independent claims 1 and 11 (Group I) and independent claim 17 (Group II) are not patentably distinct and how the search and examination of the instant application (including said distinct and independent limitations) could be made without serious burden.

Accordingly, Applicants' arguments are not persuasive. The examiner respectfully maintains restriction requirements over claims 17 and 20 (Group II) under 35 USC section 121 as previously set forth in the Office action, mailed November 6, 2007, pp. 2-4.

b) Rejections Under 35 USC 102 and 103(a) (Remarks, pp. 6-10):

Applicants' arguments have been considered but are moot in view of the new ground(s) of rejection.

### **Claim Rejections – 35 USC § 102**

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 11-14 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,463,582 to Lethin et al. (art made of record, hereafter "Lethin").

#### **Claim 11:**

Lethin discloses *a method of generating an embedded virtual machine for a specific domain of an application, comprising the step of:*

*embedding semantically enriched opcode in an interpreter loop of the virtual machine (e.g., col.31: 13-24; col.47; 1-12)*

*to efficiently decode frequently executed code (e.g., col.59: 12-31 and 42-48; col.31: 2-24).*

#### **Claim 12:**

The rejection of claim 11 is incorporated. Lethin also discloses *the semantically enriched opcode embedding step is performed dynamically on newly loaded portions of the application in dynamic languages (e.g., col.59; 12-48).*

**Claim 13:**

The rejection of claim 12 is incorporated. Lethin also discloses *the interpreter is dynamically enhanced* (e.g., col.31: 13-24).

**Claim 14:**

The rejection of claim 11 is incorporated. Lethin also discloses *secondary codes are used to accommodate the interpretation of new semantically enriched opcodes* (e.g., col.47: 1-12).

**Claim 16:**

The rejection of claim 14 is incorporated. Lethin also discloses *if a particular code is used frequently, it is made into a single byte code and the rest of the semantically enriched opcodes are accommodated by secondary opcodes* (e.g., col.31: 2-24).

**Claim Rejections – 35 USC § 103**

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4, 6, 8, and 10 are rejected 35 U.S.C. 103(a) as being unpatentable over US Patent Publication No. 2002/0069263 A1 to Sears et al. (art made of record, hereafter "Sears") in view of Lethin.

**Claim 1:**

Sears discloses *a method of optimizing the performance of an interpreter-based runtime system, the runtime system including a virtual machine, the virtual machine*

*adapted to run an application in the context of the runtime environment, the method comprising:*

*augmenting the bytecode set of the virtual machine with application-specific opcodes, thereby constituting an application domain-specific virtual machine (e.g., [0012]);*

*optimizing the virtual machine based on semantics of the application to be run on the virtual machine (e.g., [0030]);*

*performing a quantitative trade-off between time and space to determine effective semantically enriched opcode (e.g., [0033], [0040]-[0041]) and*

*encoding the semantically enriched opcode into interpreter action code based upon the trade-off (e.g., [0054] and [0052]);*

*analyzing executed bytecodes and encoding the semantically enriched opcodes into interpreter action codes of the instruction set of the virtual machine to efficiently decode the frequently executed bytecodes (e.g., [0047], [0055]); and*

*statically embedding the semantically enriched opcode to optimize execution of the interpreter-based runtime system that includes the application domain-specific virtual machine (e.g., [0012], [0033], [0052]).*

Sears discloses considering speed (e.g., [0033], [0041]) and code hotspots (e.g., [0051]) but does not explicitly disclose *analyzing frequently executed bytecodes and encoding the semantically enriched opcodes*.

However, in an analogous art, Lethin further discloses *analyzing frequently executed bytecodes and encoding the semantically enriched opcodes* (e.g., col.31: 13-24, col.47: 1-12).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine Lethin's teaching into Sears' teaching. One would have been motivated to do so to implement a new opcode that executes a basic block of instruction as suggested by Lethin (e.g., col.47: 1-26).

## **Claim 2:**

The rejection of claim 1 is incorporated. Sears also discloses *the virtual machine is a Java Virtual Machine* (e.g., [0030]).

**Claim 3:**

The rejection of claim 1 is incorporated. Sears also discloses *a new application domain-specific virtual machine is generated for different categories of applications* (e.g., [0012], [0033]).

**Claim 4:**

The rejection of claim 1 is incorporated. Sears also discloses *the dynamic and/or static behavior of the application is used to create new opcode for the application domain-specific virtual machine* (e.g., [0052], [0054]).

**Claim 6:**

The rejection of claim 1 is incorporated. Sears also discloses *the virtual machine is optimized based on a late-binding or dynamic loading model and runtime constant manifestation* (e.g., [0047], [0055]).

**Claim 8:**

The rejection of claim 1 is incorporated. Sears also discloses *semantically enriched opcode is dynamically embedded to enable it to run fast on the application domain-specific virtual machine, said virtual machine newly generated in accordance with claim 1* (e.g., [0033], [0041]).

**Claim 10:**

The rejection of claim 1 is incorporated. Sears also discloses *the semantically enriched opcode is determined based on the dynamic and/or static behavior of the application* (e.g., [0033], [0040]-[0041]).

**Conclusion**

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9. Any inquiry concerning this communication should be directed to examiner Thuy Dao (Twee), whose telephone/fax numbers are (571) 272 8570 and (571) 273 8570, respectively. The examiner can normally be reached on every Tuesday, Thursday, and Friday from 6:00AM to 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam, can be reached at (571) 272 3695.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is (571) 272 2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Thuy Dao/

Examiner, Art Unit 2192

/Tuan Q. Dam/

Supervisory Patent Examiner, Art Unit 2192